

USING A CLUSTER-WIDE SHARED REPOSITORY TO PROVIDE  
THE LATEST CONSISTENT DEFINITION OF THE CLUSTER  
(AVOIDING THE PARTITION-IN-TIME PROBLEM)

ABSTRACT OF THE DISCLOSURE

5 A quorumless network cluster is described which provides a highly available system by addressing the partition-in-space and partition-in-time problems in network clusters.

10 This solution provides a cluster manager (CM) which uses disk based messaging to manage the operation of the cluster. Each node within the cluster must have access to a shared disk to operate within the cluster. In the case of a partition-in-space problem, where a subset of nodes maintains full network connectivity among the nodes within the set but has no connectivity between the sets, the CM queries an application, operating on the cluster, to provide input to the CM to select which subset of nodes will survive as the cluster.

15 Also described is a methodology for operating the cluster in a closed loop between nodes 1 to N. Each node sends a single heartbeat message to the node ahead of it in the loop and receives a single heartbeat message from the node behind it in the loop. If a node fails to receive a heartbeat message from its predecessor in the loop, it initiates a cluster reconfiguration by sending a reconfiguration message to each other  
20 node in the cluster.

The quorumless cluster also provides a common storage for a cluster definition. A single node is designated as the coordinator node of the cluster. Each node may provide a proposed change to the cluster definition however only the coordinator node may update the cluster definition and apply the suggested changes.